



AMENDMENT UNDER 37 C.F.R. § 1.111  
Appln. No. 10/678,301

Atty. Docket No. Q77851

### REMARKS

The present invention relates to a method for inducing a non-resonant two-photon absorption.

In the present Amendment, claim 16 has been amended and placed in independent form. All other claims have been canceled pursuant to the present Amendment.

In Paragraph No. 4 of the Office Action of April 13, 2006, claims 1-14 and 18-20 were rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite. In Paragraph Nos. 7-25 multiple sets of claims were rejected under 35 U.S.C. § 102(b) over multiple references. In Paragraph Nos. 27-29, the Examiner made provisional obviousness type double patenting rejections of claims 1-20 over various claims of copending Application Nos. 10/892,306, 10/874,344, and 10/849,519, respectively. Lastly, in Paragraph No. 30, the Examiner made a provisional obviousness type double patenting rejection of claims 1, 2, and 15-20 over claims 1-26 of copending Application No. 10/679,446.

Regarding the rejection under 35 U.S.C. § 112, second paragraph, it was stated that the phrase, "undergoing a non-resonant two-photon absorption" was unclear and that it was also unclear whether the claim language embraces the ground state, the excited state, or the intermediate state. Applicant respectfully disagrees. The phrase merely indicates that by

“undergoing a non-resonant two-photon absorption,” an absorption is caused. Hence, it is also clear that the claim language embraces the ground state. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

As noted above, in accordance with this Amendment, all claims have been canceled except claim 16. Of the above rejections under 35 U.S.C. § 102(b), only the rejections in Paragraph Nos. 10 (over Kasatani), 11 (over Naqvi), 13 (over Soini), and 14 (over Iketaki) were directed to claim 16. Therefore, Applicant respectfully submits that the other rejections made under 35 U.S.C. § 102(b) have been rendered moot. Applicant respectfully requests reconsideration and withdrawal of all rejections of the currently canceled claims.

Regarding the rejection made over Kasatani in Paragraph No. 10, Applicant respectfully submits that the characterization of Kasatani in the Office Action is not entirely correct. Kasatani does not disclose the non-resonant two-photon absorption of the present invention. Rather, Kasatani discloses sequential two-photon excitation. In other words, in the case of the DODC in Figure 2 and Table 1 in Kasatani, which the Examiner cited, the absorption maximum at 308 nm is due to an excited state  $S_m$ . Figure 2 also shows that absorption maxima exist at approximately 308 nm and 582 nm (see Table 1). While some absorption does occur at the two-photon wavelength of 620 nm, such an absorption is not the non-resonant two-photon absorption of the present invention. Rather,  $S_0$  is excited to  $S_1$  by a one-photon absorption at 582 nm, and then  $S_1$  is further excited to  $S_m$  by a second one-photon absorption at 582 nm - a process shown

in Figure 3 in Kasatani. It appears that the Examiner misunderstood that Figure 2 in Kasatani shows that non-resonant two-photon absorption occurs in Kasatani, rather than the sequential two-photon excitation that Kasatani actually shows. Additionally, Applicant notes that the absorption at 620 nm lies within a one-photon band having a maximum at 582 nm. Thus, one-photon absorption preferentially occurs at 582 nm and two-photon absorption is not possible. Accordingly, Applicant respectfully submits that withdrawal of this rejection is proper.

Regarding the rejection made over Naqvi in Paragraph No. 11, Naqvi also discloses sequential two-photon excitation that consists of successive one-photon absorptions, rather than Applicant's claimed non-resonant two-photon absorption. On page 227, in the left column on the 7<sup>th</sup> line from the bottom, Naqvi teaches that  $S_1$  acts as an intermediate. However,  $S_1$  is a one-photon excited state that actually exists, which is different from the merely hypothetical intermediate state of a non-resonant two-photon excitation. That is, in Naqvi,  $S_0$  is excited to  $S_1$ .  $S_1$  further absorbs (resonates) a light at 550 nm (see Figure 1), to raise a high-order excited state. The light absorption of the  $S_1$  state is called a transient absorption. Hence, Naqvi does not teach the claimed non-resonant two-photon absorption and does not anticipate amended claim 16 herein. Applicant respectfully submits that withdrawal of this rejection is proper.

Regarding the rejection made over Soini in Paragraph No. 13, Soini does not disclose the use of an oxonol dye or a merocyanine dye. Amended claim 16 now recites that the dye is an

oxonol dye. Therefore, Applicant respectfully submits that Soini does not anticipate claim 16 and respectfully requests reconsideration and withdrawal of this rejection.

Regarding the rejection made over Iketaki in Paragraph No. 14, Iketaki also discloses a sequential two-photon excitation consisting of successive one-photon absorptions, rather than the claimed non-resonant two-photon absorption. Figures 5, 6, and 13 in Iketaki describe a Ground State,  $S_0$ , and a Second Excited State,  $S_2$ . At the midpoint of  $S_0$  and  $S_2$  is a First Excited State,  $S_1$ . However,  $S_1$  is a one-photon excited state that actually exists, which is different from the merely hypothetical intermediate state of the non-resonant two-photon excitation of the present invention. Thus, the two-photon excitation in Iketaki consists of a one-photon absorption from  $S_0$  to  $S_1$  and a second one-photon absorption from  $S_1$  to  $S_2$ . Iketaki therefore does not anticipate the non-resonant two-photon absorption of claim 16. Applicant respectfully submits that withdrawal of this rejection is proper.

Regarding the provisional obviousness type double patenting rejections, Applicant has submitted with this Amendment a Terminal Disclaimer, together with the necessary fee to thereby obviate the double patenting rejections.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

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Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

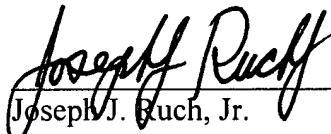
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